DOCUMENT RESUME

ED 444 533 IR 020 189

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TITLE	The Effects of Fifth Dimension on Preservice Teacher Beliefs.
PUB DATE	2000-00-00
NOTE	6p.; In: Society for Information Technology & Teacher Education International Conference: Proceedings of SITE 2000 (11th, San Diego, California, February 8-12, 2000). Volumes 1-3; see IR 020 112.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Attitude Change; *Beliefs; *Computer Uses in Education; Educational Technology; Elementary Secondary Education; Higher Education; *Learning Processes; Preservice Teacher Education; Pretests Posttests; *Teacher Attitudes; Teacher Surveys; *Teaching Methods

ABSTRACT

This research report summarizes the results of a study conducted on a group of undergraduates enrolled in an introductory preservice teacher education course. In this study, participants were asked to respond to an open-ended instrument to determine their conceptions about teaching and learning before and after a field experience with public school children enrolled in the Fifth Dimension, a program that operates in school computer labs during the afterschool hours. The pretest/posttest question "What is learning?" addressed the following categories of learning: passive/receptive; active; active and social; active and passive (combination); combination and social; constructing knowledge; and social only. The pretest/posttest question "What is teaching?" addressed the following categories of teaching: telling/transmission; helping; sharing; strategies; making children understand; collaboration; zone of proximal development; and creating an environment. Findings indicate the beliefs of preservice teachers change as a result of working in this technology rich environment. (Contains 18 references.) (MES)

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ED 444 533

The Effects of Fifth Dimension on Preservice Teacher Beliefs

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Abstract: This research report summarizes the results of a study conducted on a group of undergraduates enrolled in an introductory preservice teacher education course. In this study participants were asked to respond to an open-ended instrument to determine their conceptions about teaching and learning before and after a field experience with public school children enrolled in the Fifth Dimension. Findings indicate the beliefs of preservice teachers change as a result of working in this technology rich environment.

Introduction

When preservice teachers enter teacher education programs they bring well established beliefs about teaching and learning. These preconceptions may be subject to change (Clark, 1988; Clark & Peterson, 1986; Florio-Ruane & Lensmire, 1990; Wilson, Konopak, & Readence, 1994) or may remain the same (Kagan, 1992; Weinstein, 1989, 1990). In several research reports, the findings indicate that teacher education programs have a limited impact on the beliefs of preservice teacher teachers (Finlayson & Cohen, 1967; Lortie, 1975; McDiarmid, 1990; Zeichner & Tabachnick, 1981). The influence of pretraining is more significant than formal training in pedagogy at the university level (Zeichner & Grant, 1981).

The degree to which teacher education programs impact preservice teachers is inconclusive. However, some research findings have revealed changes in preservice teachers' beliefs about teaching (Feiman-Nemser, McDiarmid, Melnick & Parker, 1989; Florio-Ruane & Lensmire, 1990; Tamir, 1991). Feiman-Nemser et al. (1989) investigated the preconceptions of preservice teachers and concluded that at entry-level, they defined teaching as telling whereas ending-level preservice teachers defined teaching as a more complex activity. Gibson (1972) found that the early part of the teacher education program seemed to significantly effect change in students' attitudes. Watter & Ginns (1995) concluded that college course work and student teaching may have some influence on teachers' sense of efficacy. The effects of field experiences on preservice teacher beliefs demands more research and analysis. What are the results when novices enroll in introductory level education courses that require a field component? How can we structure these experiences to ensure preservice teachers exit with more knowledge of the complexity of teaching and learning?

The Study

In this study we have drawn from the research of Gibson, Feiman-Nemser, and others to investigate the effects of an introductory course and its technology-rich field experience on the entry and ending level beliefs of preservice teachers. We utilized an open-ended instrument to determine students' conceptions about teaching and learning and to determine changes that might occur over time. Participants in the study consisted of 60 students enrolled in the introductory course CI – 2800 entitled Teachers, Schools, and Learners. These students were required to complete course work and a twelve week practicum in The Fifth Dimension which

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operates in public school computer labs during the after school hours. Course content was closely linked to The Fifth Dimension through presentations, discussions, and reflections. The design of both CI – 2800 and The Fifth Dimension was based on the principles drawn from cultural-historical activity theory. Preservice teachers were expected to prepare weekly fieldnotes detailing their observations and interactions with children between the ages of five and twelve in this field experience. A website was designed for submitting, storing, and retrieving these reports.

Simple quantitative analysis was done to categorize the initial and final responses to two questions in this open-ended instrument – What is Teaching? and What is Learning? The belief survey was adapted from an instrument used at Michigan State University in their research on teacher education. It was modified for this study and has been used for three years with undergraduates at Appalachian. The value of this survey is based on the fact that it measures the attitudes of preservice teachers with regard to teaching and learning.

Qualitative analysis was used to examine the preservice teachers' fieldnotes submitted over a period of three months. These reflections gave insight into the daily events of The Fifth Dimension. Content of these fieldnotes included a description of the site, activities of the day, interactions with children, educational software selected for use, accomplishments in the lab, observations related to course content, reflections about their success with teaching, and documentation on the progress of the children.

We hypothesized that preservice teacher beliefs would be influenced by the course content and the connecting field experience.

Data Analysis

Data analysis included a comparison of the responses on the pretest and posttest on the belief survey consisting of two questions: What is teaching? and What is learning? The pretest was read to distinguish themes and to record the frequency of occurrence of these themes. The post test was read to determine whether or not identified themes on the pretest persisted and the frequency of these themes. The posttest was analyzed to determine any changes in the responses to these questions. Additionally, fieldnotes submitted by the preservice teachers were read and analyzed to distinguish themes and to determine the extent and kinds of changes that occurred as a result of interactions with children enrolled in The Fifth Dimension.

Three researchers examined the responses to the pretest and the posttest administered to the preservice teachers. Responses to the two questions were discussed and categorized. The charts below indicate initial and final explanations of teaching and learning.

What is Learning?

A total of 56 preservice teachers responded to "What is Learning?" at the beginning of the semester. The range of responses fell into the categories of passive/receptive, active, active and passive. The large majority of students (N=36) defined learning as"being able to take in new information" or the "ability to receive information" or "absorbing information" which clearly fit the passive/receptive category. Several responders, N=13, defined learning as an active process and explained further by saying "learning is receiving, processing, and using data" or "learning is having different experiences" in their explanations. Only seven students perceived learning as a combination of active and passive characteristics. Learning was described by this population as "integrating data from ones lived experiences...and assimilating the new information given them as best as their cognitive abilities facilitates" and "when some new concept is placed in your thought pattern... interacting with others and observing the events and things around."

A total of 58 preservice teachers responded to "What is Learning?" in the posttest. Following the CI-2800 course and its accompanying field experience in The Fifth Dimension, preservice teachers' ideas regarding learning revealed changes and new categories emerged. Four new categories were identified by the researchers. They included active and social, active and passive (combination) and social, constructing knowledge, and social only. A large number of respondents (N=15) maintained that learning is an active and a passive activity. Also, fifteen stated that learning is a combination of active and passive and social. Examples of their responses included "Learning is the process of retaining useful knowledge for your own educational benefit. Children learn better if they can see and touch. Students also learn from their peers in communities of practice." One defined learning as a process of constructing knowledge and said "children learn mostly by experiencing things—they like to work things out for themselves so that they can have a

working knowledge of something." Two saw learning as a social activity only and stated that "through the zone of proximal development, I can see how a competent guide can enrich the experience of the learner" and "I believe that for children to best retain their new knowledge, it has to be learned from a social context."

What is Learning?

Category	Pre	Post
Passive/Receptive	36	13
Active	13	10
Active & Social	0	2
Active & Passive (Combination)	7	15
Combination & Social	0	15
Constructing Knowledge	0	1
Social Only	0	2
Totals	56	58

Table 1: The responses to the pretest and posttest question "What is Learning?" are displayed in this table.

What is Teaching?

A total of 53 preservice teachers submitted responses to the pretest question "What is Teaching?" and seven additional responses were submitted for the posttest. The range of responses for the pretest were categorized into the areas of telling/transmission (N=33), helping (N=18), and strategies (N=2). The majority of responses identified teaching as a task of telling or transmitting knowledge and explained by stating that teaching is "passing of knowledge," "conveying information," "transferring all that you know," or "giving a person information." Several students submitted the idea that teaching is helping and explained by saying "teaching is helping a student understand" or "teaching is being able to help students learn." Two preservice teachers felt that teaching was "lecture and activities and experiments to get the students involved" and "methods ranging from field trips to guest speakers."

A total of 60 preservice teachers submitted responses to the posttest question "What is Teaching?" Five new categories including sharing (N=4), collaboration (N=3), zone of proximal development (N=2), and creating an environment (N=1) emerged. The majority of students consistently regarded teaching as telling/transmitting or helping at the conclusion of the study. In the new categories, four students defined teaching as sharing or "sharing ideas, thoughts, and facts in a way that the learners understand." Three students used collaboration as their definition and suggested that teaching is "collaborating in order to learn something and can occur between the teacher and the student, student to student, parent to student, or even parent to teacher." Two students explained that teaching is "expanding the child's zpd and getting the child to go beyond and do his best" and "teaching requires constructing zones of proximal development so children can reach their

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potential and continue to grow and learn." One student focused on the environment and defined teaching as "creating an environment in which learning is possible."

What is Teaching?

Category	Pre	Post
Telling/Transmission	33	24
Helping	18	19
Sharing	0	4
Strategies	2	6
Making Children Understand	0	1
Collaboration	0	3
Z P D	0	2
Creating an Environment	0	1
Total	53	60

Table 2: The responses to the pretest and posttest question "What is Teaching?" are displayed in this table.

Conclusions

In this study university students enrolled in an introductory level teacher education course completed open-ended questionnaires to assess existing beliefs about teaching and learning and to determine if these beliefs would change over time. With regard to the question "What is Learning?" students initially held strong convictions that learning is a passive/receptive activity. These responses are consistent with the literature on preservice teachers' beliefs (Kagan, 1992; Holt-Reynolds, 1994). Although several students' responses revealed on the pretest and posttest that learning was passive, several began to restructure their definitions and began to perceive learning as a process that included a combination of activity and social interaction. The majority of responses revealed new or broadened definitions of learning.

Initial and final responses to the question "What is Teaching?" reveal some changes in the beliefs of preservice teachers. Teaching was initially perceived as a very one-sided, teacher directed activity. Although several responders maintained this definition evidence supports a change in the definitions of many. Preservice teachers began to address the role of the teacher as one who provides assistance, assesses the zone of proximal development of the learner, provides social interaction and collaborates in learning tasks. This reconceptualization is correlated with the principles of cultural historical activity theory instantiated in the CI-2800 course.

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